

WE CLAIM:

1. A method for suppressing or reducing the immune response of a mammal to an antigen comprising orally or enterally administering to the mammal an effective immunoactive dose of a plant material derived from a plant transformant capable of producing said antigen or an immunoactive fragment or derivative thereof.
- 10 2. A method in accordance with claim 1 wherein the antigen is a human Major Histocompatibility Complex class II protein.
- 15 3. A method in accordance with claim 1 wherein the antigen is a human Major Histocompatibility Complex class II α chain.
- 20 4. A method in accordance with claim 1 wherein the antigen is a human Major Histocompatibility Complex class II β chain.
5. A method in accordance with claim 1 wherein the antigen is an autoantigen.
- 25 6. A method in accordance with claim 1 wherein the antigen is human glutamic acid decarboxylase.
- 30 7. A method in accordance with claim 5 wherein the autoantigen is involved in the pathogenesis of a disease selected from the group consisting of Type I diabetes mellitus, lupus erythematosus, thyroiditis, multiple sclerosis, uveitis and Crohn's disease.
- 35 8. A method in accordance with any of the preceding claims wherein the plant is transformed with a vector in accordance with claim 17.

9. A method in accordance with any of the preceding claims wherein the plant is selected from the group consisting of potato, tomato, alfalfa and canola.
- 5 10. A method for suppressing the rejection of engrafted donor tissue by a recipient mammal comprising orally or enterally administering to the mammal an effective immunosuppressive dose of a plant material derived from a plant transformant capable of producing a transplantation 10 antigen or an immunosuppressive fragment or derivative of said antigen.
11. A method in accordance with claim 10 wherein the antigen is a human Major Histocompatibility Complex 15 protein or an α or β chain thereof.
12. A method in accordance with any of claims 10 to 11 wherein the plant is transformed with a vector in accordance with claim 17.
- 20 13. A method in accordance with any of the preceding claims wherein the plant material is selected from the group consisting of plant parts, an extract of total plant protein, a partially purified plant protein preparation 25 and a purified plant protein preparation.
14. A pharmaceutical composition for suppressing or reducing the immune response of a mammal to an antigen comprising an oral or enteral dosage form comprising an 30 effective dose of a plant material derived from a plant transformant capable of producing said antigen or an immunosuppressive fragment or derivative thereof and a pharmaceutically acceptable carrier.
- 35 15. A pharmaceutical composition for suppressing the rejection of engrafted donor tissue by a recipient mammal comprising an oral or enteral dosage form comprising an

effective dose of a plant material derived from a plant transformant capable of producing a transplantation antigen or an immunosuppressive fragment or derivative of said antigen and a pharmaceutically acceptable carrier.

5

16. A pharmaceutical composition in accordance with claim 15 wherein the antigen is a human Major Histocompatibility Complex Class II α chain or β chain polypeptide or immunosuppressive fragment or derivative thereof.

10

17. A recombinant vector for transformation of a plant host comprising a plant promoter sequence operably linked to a DNA sequence encoding a heterologous polypeptide and a suitable termination sequence in proper reading frame with said DNA sequence.

15

18. A recombinant vector in accordance with claim 17 wherein the heterologous polypeptide is a mammalian protein.

20

19. A recombinant vector in accordance with claim 18 wherein the promoter sequence is the Cauliflower Mosaic Virus 35S promoter, the DNA sequence encodes a human Major Histocompatibility Complex Class II α chain polypeptide or β chain polypeptide and the termination sequence is a nopaline synthase sequence.

25

30

20. A process for producing a human Major Histocompatibility Complex Class II α chain or β chain polypeptide in a plant comprising transforming a plant with the recombinant vector of claim 19 and expressing the heterologous polypeptide encoded therein.

35

21. A recombinant vector in accordance with claim 18 wherein the promoter sequence is the Cauliflower Mosaic Virus 35S promoter, the DNA sequence encodes human

glutamic acid decarboxylase and the termination sequence
is a nopaline synthase sequence.

22. A process for producing human glutamic acid
5 decarboxylase in a plant comprising transforming a plant
with the recombinant vector of claim 21 and expressing
the heterologous polypeptide encoded therein.
- 10 23. A recombinant vector in accordance with claim 18
wherein the mammalian signal-peptide encoding portion of
said DNA sequence is replaced by a DNA sequence encoding
a plant signal sequence.
- 15 24. A transgenic plant transfected with the recombinant
vector of any of claims 17 to 19, 21 or 23.
25. A method in accordance with claim 1 wherein the
antigen is a mouse Major Histocompatibility Complex class
II protein or an α or β chain thereof.